

Notice of Allowability	Application No.	Applicant(s)
	09/683,571	ENGSTROM ET AL.
	Examiner	Art Unit
	Michael B. Holmes	2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to October 18, 2004.
2. The allowed claim(s) is/are 22-47, 49-66, 68, 70-72.
3. The drawings filed on 19 January 2002 are accepted by the Examiner.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some*
 - c) None
 of the:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No./Mail Date _____.
 - (b) including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
7. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. Notice of References Cited (PTO-892)
2. Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____.
4. Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. Notice of Informal Patent Application (PTO-152)
6. Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. Examiner's Amendment/Comment
8. Examiner's Statement of Reasons for Allowance
9. Other _____.



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Examiner's Detailed Office Action

1. Claims 22-47, 49-66, 68, 70-72 are allowed.
2. Claims 1-21, 48, 67, & 69 have been canceled.

Examiner's Amendment

In the Claims:

3. Claims 22-34, 42, 45, 49, 50, 57, 59, 61, 64, 68, 70, 71, & 72 have been amended as shown below to incorporate a "*computer implemented*" method. This amendment was authorized by Mr. Tracy W. Druce in a telephone conference held on November 08, 2004.
22. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

wherein the measurement of the at least one driver characteristic is made by direct body scan of the driver.

23. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

wherein the measurement of the at least one vehicle performance characteristic is at least one of (i) non-GPS based and (ii) geographically unspecific.

24. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

wherein a resulting data set from the collection of the plurality of measurements of at least one driver characteristic and at least one vehicle characteristic has a capacity to be statistically segregated into a plurality of driving environment categories.

25. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

wherein the measurement of at least one vehicle characteristic comprises quantification of at least one of acceleration pedal position, gear selection, turn indicator activity, vehicle speed, steering angle, engine speed and brake activity.

26. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

utilizing as reference data, annotated data values incorporating a driver indication of driving environment existing at the time a respective annotated data value was collected thereby enabling look-up analysis of each real-time collected measurement.

27. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle said method comprising,

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

wherein the at least one driver characteristic is driver eye movement.

28. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

wherein the at least one driver characteristic is driver head movement.

29. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle said method comprising

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

utilizing predetermined criteria for predicting driving environments, the predetermined criteria differentiating between at least two of a plurality of driving environments including highway driving, main road driving, suburban driving and city driving.

30. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

collecting and recording a plurality of measurements of a plurality of driver characteristics and a plurality of vehicle characteristics from a plurality of subjects thereby creating a collection of reference values for the driver and vehicle characteristics.

31. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting on a substantially real-time basis a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

collecting and recording a plurality of measurements of a plurality of driver characteristics and a plurality of vehicle characteristics from a plurality of subjects driving a

plurality of routes thereby creating a collection of reference values for the driver and vehicle characteristics.

32. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting, on a substantially real-time basis a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

considering at least acceleration pedal position, gear selection, turn indicator activity, vehicle speed, steering angle, engine speed and brake activity in the evaluation.

33. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

considering at least one of acceleration pedal position, gear selection, turn indicator activity, vehicle speed, steering angle, engine speed and brake activity in the evaluation.

34. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

analyzing in a pre-processing step over a predetermined time window, a series of iteratively collected measurements of at least one of the plurality of measurements of at least one driver characteristic and at least one vehicle characteristic for purposes of feature extraction.

42. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting on a substantially real-time basis, a plurality of measurements of at least one driver characteristic and at least one vehicle characteristic;

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

ascertaining a probability of a particular driving environment occurring during a predetermined time window utilizing a neural network to analyze the plurality of collected measurements.

45. A computer implemented method for optimizing driver-vehicle performance in a driver operated vehicle, said method comprising:

collecting, on a substantially real-time basis, a plurality of measurements of at least one

driver characteristic and at least one vehicle characteristic; and

evaluating said plurality of measurements to predict a current driving environment within which the vehicle is presently being driven; and

effecting changes in performance characteristics of the vehicle based on the evaluation of the plurality of measurements of at least one driver characteristic and at least one vehicle characteristic.

49. A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, at least one of (i) a non-GPS-based, geographically unspecific vehicle characteristic and (ii) a physical characteristic of an operator of an operator-driven vehicle, and therefrom collecting a data set for statistical pattern recognition analysis;

performing statistical pattern recognition analysis on the data set;

ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and

computing statistical characteristics of the data set including at least one of the parameters average magnitude, variability and change rate of the data set.

50. A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving, environment of an operator-driven

vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, at least one of (i) a non-GPS-based, geographically unspecific vehicle characteristic and (ii) a physical characteristic of an operator of an operator-driven vehicle, and therefrom collecting a data set for statistical pattern recognition analysis;

performing statistical pattern recognition analysis on the data set; and
ascertaining a large time-scale, driving pattern occurring during the collection of the data set based on the analysis; and

categorizing the ascertained large time-scale driving pattern occurring during the collection of the data set into one category, among a plurality of categories, that is representative of the driving environment occurring during the collection of the data set.

57. A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, at least one of (i) a non-GPS-based geographically unspecific vehicle characteristic and (ii) a physical characteristic of an operator of an operator-driven vehicle, and therefrom collecting a data set for statistical pattern recognition analysis;

performing statistical pattern recognition analysis on the data set;
ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis;

producing a data stream constituted at least in part by iterative measurements of the at least one of (i) a non-GPS-based, (ii) geographically unspecific vehicle characteristic and (iii) a physical characteristic of an operator of an operator-driven vehicle; and

selecting members of the data set based on application of a large-scale predetermined time window to the data stream.

59. A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, at least one of (i) a non-GPS-based, geographically unspecific vehicle characteristic and (ii) a physical characteristic of an operator of an operator-driven vehicle and therefrom collecting a data set for statistical pattern recognition analysis;

performing statistical pattern recognition analysis on the data set;

ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and

producing a data stream constituted at least in part by iterative measurements of the at least one of (i) a non-GPS-based, (ii) geographically unspecific vehicle characteristic and (iii) a physical characteristic of an operator of an operator-driven vehicle; and

ascertaining a small time-scale driving pattern occurring during the collection of the data set by analysis of a sub-set sampling therefrom based on application of a small-scale predetermined time window to the data stream.

61. A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, at least one of (i) a non-GPS-based, geographically unspecific vehicle characteristic and (ii) a physical characteristic of an operator of an operator-driven vehicle, and therefrom collecting a data set for statistical pattern recognition analysis;

performing statistical pattern recognition analysis on the data set;

ascertaining, a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and

wherein each member of the data set represents a discrete quantification of at least one vehicle characteristic selected from a group of vehicle characteristics including (i) accelerator pedal position, (ii) gear selection, (iii) turn indicator position, (iv) vehicle speed, (v) steering angle, (vi) engine speed and (vii) brake activity.

64. A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving, environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, at least one of (i) a non-GPS-based, geographically unspecific vehicle characteristic and (ii) a physical characteristic of an operator of an operator-driven vehicle, and therefrom collecting a data set for statistical pattern recognition analysis;

performing statistical pattern recognition analysis on the data set;
ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and

wherein the physical characteristic of the operator is head orientation.

68. A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, a vehicle characteristic and collecting therefrom a data set for statistical pattern recognition analysis;
performing statistical pattern recognition analysis on the data set;
ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and

wherein said vehicle characteristic is at least one of (i) non-GPS-based and (ii) geographically unspecific.

70. A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven

vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, a physical characteristic of an operator of an operator-driven vehicle, and therefrom collecting a data set for statistical pattern recognition analysis;

performing statistical pattern recognition analysis on the data set;

ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and

wherein said physical characteristic of the operator is head movement.

71. A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, a physical characteristic of an operator of an operator-driven vehicle, and therefrom collecting a data set for statistical pattern recognition analysis;

performing statistical pattern recognition analysis on the data set;

ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and

wherein said physical characteristic of the operator is eye movement.

72. A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns indicative of the current driving environment of an operator-driven vehicle, said method comprising:

repetitively sensing, on an essentially real-time basis, a physical characteristic of an operator of an operator-driven vehicle; and therefrom collecting a data set for statistical pattern recognition analysis;

Performing statistical pattern recognition analysis on the data set;
ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and

determining a current driving environment from said ascertained large time-scale driving pattern.

REASONS FOR ALLOWANCE

4. The following is an Examiner's statement for reasons for allowance:

The closest prior art *Lemelson et al.* (USPN 5,983,161) & *Nasburg* (USPN 5,801,943) do not teach or render obvious applicant's claimed invention. In particular, as pointed out below, the prior art lacks certain features and the combination as specified in the respective claims.

5. With regards to claim 22 *Lemelson et al.* & *Nasburg* do not disclose "*A computer implemented method for optimizing driver-vehicle performance wherein the measurement of the at least one driver characteristic is made by direct body scan of the driver and wherein the measurements are used to predict a current driver environment.*"

6. With regards to claim 23 *Lemelson et al. & Nasburg* do not disclose “ *... measuring a vehicle and a driver characteristic and the measurement of the at least one vehicle performance characteristic is at least one of (i) non-GPS based and (ii) geographically unspecific is used to predict a current driver environment.*”
7. With regards to claim 24 *Lemelson et al. & Nasburg* do not disclose “ *... a resulting data set from the collection of the plurality of measurements of at least one driver characteristic and at least one vehicle characteristic has a capacity to be statistically segregated into a plurality of driving environment categories.*”
8. With regards to claim 25 *Lemelson et al. & Nasburg* do not disclose “ *... wherein the measurement of at least one vehicle characteristic comprises quantification of at least one of acceleration pedal position, gear selection, turn indicator activity, vehicle speed, steering angle, engine speed and brake activity.*”
9. With regards to claim 26 *Lemelson et al. & Nasburg* do not disclose “ *... utilizing as reference data, annotated data values incorporating a driver indication of driving environment existing at the time a respective annotated data value was collected thereby enabling look-up analysis of each real-time collected measurement.*”
10. With regards to claim 27 *Lemelson et al. & Nasburg* do not disclose “ *... wherein the at least one driver characteristic is driver eye movement.*”
11. With regards to claim 28 *Lemelson et al. & Nasburg* do not disclose “ *... wherein the at least one driver characteristic is driver head movement.*”

12. With regards to claim 29 *Lemelson et al. & Nasburg* do not disclose “ *... utilizing predetermined criteria for predicting driving environments, the predetermined criteria differentiating between at least two of a plurality of driving environments including highway driving, main road driving, suburban driving and city driving.*”
13. With regards to claim 30 *Lemelson et al. & Nasburg* do not disclose “ *... collecting and recording a plurality of measurements of a plurality of driver characteristics and a plurality of vehicle characteristics from a plurality of subjects thereby creating a collection of reference values for the driver and vehicle characteristics.*”
14. With regards to claim 31 *Lemelson et al. & Nasburg* do not disclose “ *... collecting and recording a plurality of measurements of a plurality of driver characteristics and a plurality of vehicle characteristics from a plurality of subjects driving a plurality of routes thereby creating a collection of reference values for the driver and vehicle characteristics.*”
15. With regards to claim 32 *Lemelson et al. & Nasburg* do not disclose “ *... considering at least acceleration pedal position, gear selection, turn indicator activity, vehicle speed, steering angle, engine speed and brake activity in the evaluation.*”
16. With regards to claim 33 *Lemelson et al. & Nasburg* do not disclose “ *... considering at least one of acceleration pedal position, gear selection, turn indicator activity, vehicle speed, steering angle, engine speed and brake activity in the evaluation.*”
17. With regards to claim 34 *Lemelson et al. & Nasburg* do not disclose “ *... analyzing in a pre-processing step over a predetermined time window, a series of iteratively collected measurements of at least one of the plurality of measurements of at least one driver characteristic and at least one vehicle characteristic for purposes of feature extraction.*”

18. With regards to claim 42 *Lemelson et al. & Nasburg* do not disclose “ *... ascertaining a probability of a particular driving environment occurring during a predetermined time window utilizing a neural network to analyze the plurality of collected measurements.*”
19. With regards to claim 45 *Lemelson et al. & Nasburg* do not disclose “ *... effecting changes in performance characteristics of the vehicle based on the evaluation of the plurality of measurements of at least one driver characteristic and at least one vehicle characteristic.*”
20. With regards to claim 49 *Lemelson et al. & Nasburg* do not disclose “ *... A computer implemented method for ascertaining, on an essentially real-time basis, large time-scale driving patterns by repetitively sensing, on an essentially real-time basis, at least one of (i) a non-GPS-based, geographically unspecific vehicle characteristic and (ii) a physical characteristic of an operator of an operator-driven vehicle.*”
21. With regards to claim 50 *Lemelson et al. & Nasburg* do not disclose “ *... categorizing the ascertained large time-scale driving pattern occurring during the collection of the data set into one category, among a plurality of categories, that is representative of the driving environment occurring during the collection of the data set.*”
22. With regards to claim 57 *Lemelson et al. & Nasburg* do not disclose “ *... ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and*
producing a data stream constituted at least in part by iterative measurements of the at least one of (i) a non-GPS-based, (ii) geographically unspecific vehicle characteristic and (iii) a physical characteristic of an operator of an operator-driven vehicle; and

selecting members of the data set based on application of a large-scale predetermined time window to the data stream."

23. With regards to claim 59 *Lemelson et al. & Nasburg* do not disclose "*... ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and*

producing a data stream constituted at least in part by iterative measurements of the at least one of (i) a non-GPS-based, (ii) geographically unspecific vehicle characteristic and (iii) a physical characteristic of an operator of an operator-driven vehicle; and
ascertaining a small time-scale driving pattern occurring during the collection of the data set by analysis of a sub-set sampling therefrom based on application of a small-scale predetermined time window to the data stream."

24. With regards to claim 61 *Lemelson et al. & Nasburg* do not disclose "*...*
ascertaining, a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and

wherein each member of the data set represents a discrete quantification of at least one vehicle characteristic selected from a group of vehicle characteristics including (i) accelerator pedal position, (ii) gear selection, (iii) turn indicator position, (iv) vehicle speed, (v) steering angle, (vi) engine speed and (vii) brake activity."

25. With regards to claim 64 *Lemelson et al. & Nasburg* do not disclose "*... ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and*

wherein the physical characteristic of the operator is head orientation.”

26. With regards to claim 68 *Lemelson et al. & Nasburg* do not disclose “*... ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and*

wherein said vehicle characteristic is at least one of (i) non-GPS-based and (ii) geographically unspecific.”

27. With regards to claim 70 *Lemelson et al. & Nasburg* do not disclose “*... ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and*

wherein said physical characteristic of the operator is head movement.”

28. With regards to claim 71 *Lemelson et al. & Nasburg* do not disclose “*... ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and*

wherein said physical characteristic of the operator is eye movement.”

29. With regards to claim 72 *Lemelson et al. & Nasburg* do not disclose “*... ascertaining a large time-scale driving pattern occurring during the collection of the data set based on the analysis; and*

determining a current driving environment from said ascertained large time-scale driving pattern.”

Correspondence Information

30. Any inquires concerning this communication or earlier communications from the examiner should be directed to **Michael B. Holmes**, who may be reached Monday through Friday, between 8:00 a.m. and 5:00 p.m. EST. or via telephone at **(571) 272-3686** or facsimile transmission **(571) 273-3686** or email Michael.holmesb@uspto.gov.

If attempts to reach the examiner are unsuccessful the **Examiner's Supervisor**, **Anthony Knight**, may be reached at **(571) 272-3687**.

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